

CLAIMS

1. A method of managing a plurality of parallel hybrid ARQ processes involving packet combining including at least one of a reserved and/or additional HARQ process comprising the step of scheduling the available HARQ processes for transmission in accordance with at least one resource allocation parameter.
2. The method according to claim 1, wherein the radio resource allocation parameter is a modulation coding scheme (MCS) level.
3. The method according to claim 1, wherein the radio resource allocation parameter is a transport format of the data transmission, e.g. a data packet size.
4. The method according to claim 1, wherein the radio resource allocation parameter is the necessary soft buffer size at the receiver of a communication system.
5. The method according to one of claims 1-4, wherein the use of a reserved or additional HARQ process is restricted for a separate data flow ID or a logical channel ID.
6. The method according to claim 5, wherein the use of a reserved or additional HARQ process is restricted to data flow or logical channel carrying signalling data of radio resource control RRC or other higher layer signalling.
7. The method according to claim 5, wherein the use of a reserved or additional HARQ process is restricted to packets retransmitted by higher layers.
8. The method according to claim 1, wherein the radio resource allocation parameter is a traffic descriptor.

9. A method of a plurality of hybrid HARQ processes including at least one of a reserved and/or additional HARQ process in a mobile communication system, wherein data flows are transmitted from a transmitter to a receiver comprising the steps of:

scheduling a number of transmission time intervals (TTI) in advance for a plurality of HARQ processes for transmission to the receiver;

predicting the channel conditions for the transmitted HARQ processes over at least one of the scheduled TTI; and

assigning HARQ processes for transmission in accordance with the predicted channel conditions and available HARQ processes.

10. The method according to one of the claims 1-9, wherein the step of scheduling comprises ordering a plurality of data flows in at least one priority queue and emptying the priority queue to one or a plurality of configured HARQ processes for transmission.
11. The method according to one of claims 1-10, wherein the reserved and/or additional HARQ process has a limited functionality compared with a plurality of HARQ processes.
12. The method according to one of claims 1-11, wherein the reserved and/or additional HARQ process supports a maximum possible/lower modulation coding scheme (MCS) level compared with the plurality of HARQ processes.
13. The method according to one of claims 1-12, wherein the reserved and/or additional HARQ process supports a maximum possible/lower transport format resource combination (TFRC) compared with the plurality of HARQ processes.

14. The method according to one of claims 1-13, wherein the reserved and/or additional HARQ process supports Chase Combining or Incremental Redundancy according to available memory in the soft buffer.
15. The method according to one of claims 1-14, wherein for the reserved and/or additional HARQ process, a smaller soft buffer size is reserved at the receiver compared with that reserved for one of a plurality of HARQ processes.
16. The method according to one of claims 1 -15, wherein the transmitter signals to the receiver to use a separate re-ordering buffer for the reserved and/or additional HARQ process.
17. The method according to one of claims 1-16, wherein an HARQ process identification is signalled to the receiver.
18. The method according to one of claims 1-17, wherein the number of HARQ processes and/or functionality of additional processes are matched to the round trip delay (RTD) caused by transmission time and processing time at the receiver and the transmitter.
19. The method according to claim 1, wherein the number of configured HARQ processes varies dynamically in accordance with a system parameter.
20. The method according to claim 19, wherein the system parameter is one of round trip time, processing time, traffic burstiness, quality of service, modulation coding scheme, timing of shared channels and minimum transmission time interval.
21. The method according to one of claims 1-20, wherein an HARQ process configuration is signalled from the transmitter to the receiver by HARQ protocol control packet.

22. The method according to claim 21, wherein an HARQ protocol control packet is identified by inband signalling.
23. The method according to one of claims 21 or 22, wherein control information may be signalled explicitly or implicitly.